



Australian Bureau of Statistics

Education Services

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Resources



GEO 05 – Population of Australian Capital Cities

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Subject

Geography

Suggested Level

Years 8–10

Overview

This classroom activity compares the size of Australia's state capitals and develops the use of proportional symbols to represent the data. There are two opportunities for extension. For a more accurate representation of the data, proportional circles may be drawn by making calculations of the areas of a circle. A second option for extension involves the integration of the statistics into a geographic information system (GIS) in order to develop the skills of digital thematic mapping.

Requirements

- Map of Australia showing states and territories
- Tracing paper
- Computer and GIS software

Instructions

Australia's **Estimated Resident Population** at December 2008 was 21 644 000 people (Australian Demographic Statistics, Dec 2008, cat # 3101.0). Australia's population density at December 2008 was 2.8 people per square kilometre (sq.km). However, population density is much higher in major cities.

1. Using Table 1, ask students to rank Australian capital cities according to the size of their population and complete column (a).
2. Ask students to estimate the population of Australian capital cities and complete column (b) in Table 1.

TABLE 1. RANK AND POPULATION OF AUSTRALIA'S CAPITAL CITIES			
Capital City	(a) Rank (1-8) according to the size of population.	(b) Estimate the population of Australian capital cities.	(c) Population Capital City Statistical Division, June 2006
Adelaide			
Brisbane			
Canberra			
Darwin			
Greater Hobart			
Melbourne			
Perth			
Sydney			

3. Using a map of Australia showing states and territory boundaries (see map attached), ask students to represent their estimate of population from column (b) in Table 1 by sketching a proportional symbol located over each capital city. For a more accurate representation of the population of each capital city, refer to Extension 1.
4. Provide students with the population for each state capital as shown in the 'Answer' section, Table 2, below and ask students to update their copy of Table 1. Using a tracing overlay ask students to sketch proportional symbols to represent the population of capital city.
5. Compare the maps produced in 3 and 4 above. How accurately did students predict the size of Australian capital cities? How well did they know the size of their own state capital city?

Extension

1. Represent the area of each capital city as a proportional circle drawn accurately to scale. The instructions for calculating proportional circles are shown below.
When proportional circles are used, the area of the circle represents the population of the city. To draw a circle the radius must first be

calculated. This is done by obtaining the square root of each capital city population and choosing an appropriate scale to represent the data.

Population of city (P) is to be represented by the area of a circle = πr^2 . Therefore the radius is proportional to the square root of the population.

When all radii have been calculated choose a suitable scale to represent the data. On an Australian map (A4) size, then a scale for each radius could be 1mm represents 100 people.

Example: Brisbane

Population = 1,810,900 and radius is represented by $\sqrt{1,810,900} = 1345.70$. If 1 mm is used to represent a radius of 100 then Brisbane would be represented by a circle with radius of 13.5mm.

This activity could be delivered with the aid of a geographic information system. The thematic mapping capability could be used to accurately draw the proportional symbols

Answers

TABLE 2. POPULATION OF AUSTRALIA'S CAPITAL CITIES, JUNE 2006			
Capital city	(a) Rank (101508) according to the size of population.	(b) Estimate the population of Australian capital cities.	Population capital city statistical division, June 2006
Adelaide			1 146 119
Brisbane			1 820 400
Canberra			333 940
Darwin			114 368
Greater Hobart			205 566
Melbourne			3 744 373
Perth			1 519 510
Sydney			4 284 379

Source: Table 7.19, *Year Book Australia*, 2008 (cat # 1301)

TABLE 3. CALCULATIONS FOR CREATION OF PROPORTIONAL SYMBOLS TO REPRESENT THE POPULATION OF AUSTRALIA'S CAPITAL CITIES			
Capital city	Population capital city statistical division, June 2006	Square root of population	Possible scale for A4 map (1mm represents 100 people)
Adelaide	1 146 119	1070.57	10.7
Brisbane	1 820 400	1349.22	13.5
Canberra	333 940	577.88	5.8

Darwin	114 368	338.18	3.4
Greater Hobart	205 566	453.39.	4.5
Melbourne	3 744 373	1935.04	19.4
Perth	1 519 510	1232.68	12.3
Sydney	4 284 379	2069.87	20.7

Glossary

Estimated Resident Population (ERP)

Is the count of all people regardless of citizenship and nationality, who usually live in Australia, with the exception of foreign diplomats and their families. It is the official measure of the Australian population.

Proportional symbols

Symbols used on a map where the size of the symbol is proportional to the value it represents.

References

Note: Links to ABS publications are to the most recent release. Previous releases can be accessed by selecting the Past and Future Releases tab.

Year Book Australia, 2008 (cat no 1301.0)

Download the Activity

Student Activity



Geo_05_Pop of Aust Cap Cities_Worksheet 1.rtf

Teacher Solutions



Geo_05_Pop of Aust Cap Cities_Teacher Answer Sheet.rtf

Attachments



GEO_05_Map.gif

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